

I CLAIM:

(a) providing a mixture of a moldable polymeric material and a lower viscosity additive, said polymeric material and said lower viscosity additive being in the solid state; and

(b) applying mechanical energy through solid state shear pulverization in the presence of cooling to said mixture to maintain materials in the mixture in the solid state thereby compatibilizing the mixture to form a homogenous material, said homogenous material having a melt flow rate which is higher than said moldable polymeric material.

2. The method of claim 1, wherein said lower viscosity additive is a polymeric material.

3. The method of claim 2, wherein said polymeric  
20 materials are of the same type of polymer.

4. The method of claim 3, wherein said polymeric materials are polyolefins.



11. The method of claim 10, wherein said first and second moldable polymers are each selected from the group consisting of polyolefins, polyesters, polycarbonates, polyamides, vinyl polymers, polyurethenes, polyacetals, polyphenylene oxide, and polyphenylene sulfide.

12. The method of claim 11, wherein said vinyl polymers are selected from polystyrene and polyvinyl chloride.

13. The method of claim 11, wherein said polyolefins are selected from the group consisting of polyethylene and polypropylene.

14. The method of claim 11, wherein said polyesters are polyalkylene terephthalates.

15. An article molded from said homogenous material.

16. The article of claim 15 in the form of a film.

17. A method of preparing a moldable polymeric material comprising the steps of:

(a) providing a mixture of a moldable polymeric material and a lower viscosity additive, said polymeric material and said lower viscosity additive being in the solid state;

(b) applying mechanical energy through solid state shear pulverization in the presence of cooling to said mixture to maintain materials in the mixture in the solid state thereby compatibilizing the mixture to form a homogenous material, said homogenous material having a melt flow rate which is higher than said moldable polymeric material;

(c) melting said homogenous material; and  
(d) molding said molten homogenous material.

18. The method of claim 17, wherein said molten homogenous material is injection molded.

19. The method of claim 17, wherein said molten homogenous material is extrusion molded.

20. The method of claim 17, wherein said molten homogenous material is blow molded.

21. The method of claim 20, wherein said molten homogenous material is blow molded into a thin film.

5        22. The method of claim 17, wherein said lower viscosity additive is a polymeric material.

23. The method of claim 21, wherein said lower viscosity additive is a polymeric material.

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24. The method of claim 22, wherein said polymeric materials are of the same type of polymer.

25. The method of claim 23, wherein said polymeric  
15 materials are of the same type of polymer.

26. The method of claim 25, wherein said polymeric materials are polyolefins.

20        27. The method of claim 26, wherein said polyolefins are low density polyethylene.

28. The method of claim 26, wherein said polyolefins are high density polyethylene.

29. The method of claim 2, wherein said moldable polymeric material comprises 20 to 98 wt.% and said lower viscosity additive 2 to 80 wt.% of said mixture.

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30. The method of claim 29, wherein said moldable polymeric material comprises 70 to 98 wt.% and said lower viscosity additive 2 to 30 wt.% of said mixture.

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31. The method of claim 22, wherein said moldable polymeric material comprises 20 to 98 wt.% and said lower viscosity additive 2 to 80 wt.% of said mixture.

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32. The method of claim 31, wherein said moldable polymeric material comprises 70 to 98 wt.% and said lower viscosity additive 2 to 30 wt.% of said mixture.

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33. The method of claim 17, wherein said homogenous material is in the form of a powder.

34. The method of claim 33, wherein said homogenous material is melted directly from said powder and said molten homogenous material molded.

35. The method of claim 33, wherein said homogenous material is melted directly from said powder and said molten homogenous material is formed into pellets, said pellets being melted and molded according to step (d).

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36. The method of claim 34, wherein said powder is melted and molded simultaneously by rotational molding.

37. The method of claim 2, wherein said lower  
10 viscosity additive has a melt flow rate at least five times higher than said moldable polymeric material.

38. The method of claim 4, wherein said lower  
15 viscosity additive has a melt flow rate at least five times higher than said moldable polymeric material.

39. The method of claim 22, wherein said lower  
viscosity additive has a melt flow rate at least five times higher than said moldable polymeric material.

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40. The method of claim 26, wherein said lower viscosity additive has a melt flow rate at least five times higher than said moldable polymeric material.

